

THE ALYDINÆ OF THE UNITED STATES.

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The family Coreidæ consists of five subfamilies, two of which, the Merocorinæ and Pseudophlœinæ, are very small. The larger divisions, often ranked as families themselves, are: Corizinæ, characterized by a mesal constriction of the fourth dorsal abdominal segment and the obsolescence of the scent-gland orifices; Alydinæ, distinguished by the wide head and unusually small bucculæ; and Coreinæ, which, together with the smaller groups named above, includes the rather diverse remaining members of the family.

The Alydinæ form a compact and easily recognizable group found in all parts of the world and include several cosmopolitan genera. Those occurring in the United States all possess a head at least three-fourths as wide as the pronotum and all except the last two genera have well developed and conspicuous scent gland orifices in front of the posterior coxæ. The bucculæ are short, not surpassing the insertion of the antennæ and the scutellum is narrower than the intraocular part of the head.

In this paper eleven genera, nineteen species and seven varieties are recognized, of which one species and three varieties are new. Material was available in all except three subtropical species (numbers 3, 4 and 8) each of which has been reported from the United States only once. The discussions of these three are based on the descriptions.

Eight of the species found in the United States, and six of the genera, are subtropical, and are confined to the southern tier of States. Four are probably limited to the Rocky Mountains and Pacific coast, and three almost entirely to the States north of the Ohio River. The remaining four have been collected in nearly every part of the United States. *Protenor belfragei*, *Megalotomus 5-spinosus*, *Alydus eurinus*, and *A. conspersus* are among the most common Heteroptera of the temperate zone.

No members of the subfamily are known to be of economic importance. The common species are found in meadows or

about flowers and along roadsides. So far as observed, they are single brooded, the adults appearing in July and August and, in some species, hibernating.

In considering the distribution the published papers are indicated by numerals, and the available collections by letters used in the same way as follows: the collection of Dr. E. D. Ball, ^b; that of the Milwaukee public museum, ^m; that of Prof. W. S. Marshall, University of Wisconsin, ^u; that of the Wisconsin Agricultural Experiment Station, ^a; of Mr. Wm. J. Gerhard, of Chicago, ^g; and of the State Entomologist's office, including the author's collections, ^s. These letters thus indicate for each species the place of collection and the present ownership of the material with which the author has been working. The state names printed in *Italics* are now added to the distribution as given by Van Duzee (1917), and localities are credited to his catalogue when the present writer could find no other published records for them.

The writer is indebted to Mr. Wm. J. Gerhard, Curator of Insects in the Field Museum, Chicago; to Mr. T. E. B. Pope, Curator of Insects in the Milwaukee Museum; to Prof. H. F. Wilson of the Agricultural Experiment Station; and to Prof. W. S. Marshall of the University of Wisconsin, for their courtesy in allowing material in their private collections or under their charge to be freely used. Mr. H. G. Barber and Mr. E. P. Van Duzee have also kindly loaned some valuable specimens. Special acknowledgments are due to Dr. E. D. Ball with whose library and collections most of the work reported herein was done and who has kindly aided with valuable suggestions. Many of the biological notes are on his authority, in particular those from Colorado.

KEY TO TRIBES OF ALYDINÆ.

- a. Posterior femora not armed with spines; lateral plates of female hypopygium (in species examined) contiguous from base to apex, mesal plates concealed or wanting.
 - b. Apical segment of rostrum twice as long as third, second longer than two apical segments together.....*Micrellytrini*
 - bb. Apical segment of rostrum subequal to third, second not longer than third and fourth together; body and legs greatly elongated.....*Leplocorisini*
- aa. Posterior femora armed beneath with a row of spines; lateral plates of female hypopygium distant, at least at base, exposing mesal plates, (except in *Stachyocnemus*).....*Alydini*

Tribe **Micrelytrini** Stal (1867).

One northern, three subtropical and several tropical species are united in this tribe. They resemble each other closely, are more elongate and slender than an *Alydus*, and present a trim appearance. In the first two genera the union of the juga above and in front of the tylus gives the head a very peculiar aspect.

KEY TO GENERA OF MICRELYTRINI.

- a. Juga contiguous above apex of tylus; posterior angles of metapleura acute. more or less produced; lateral angles of pronotum and apex of scutellum unarmed.
 - b. Juga, as seen from the side, split at apex and much longer than tylus; antennæ with first two segments subequal.....*Protenor*
 - bb. Juga as seen from the side, entire at apex, not longer than tylus; antennæ with second segment nearly twice as long as first.*Darmistus*
- aa. Juga not contiguous at apex, never exceeding tylus.
 - b. Pronotum with lateral angles each armed with spine; scutellum with spine at apex; posterior angles of metapleura more or less acute.....*Cydamus*
 - bb. Pronotum with lateral angles unarmed; lateral and posterior margins of metapleura forming a right angle.....*Esperanza*

Protenor Haglund.Haplotype *belfragei* Haglund.

Protenor Haglund (1868); Stal (1867) 543, nom. nud., (1870) 217, (1873) 87; Distant (1881) 160.

Tetrarhinus Provancher (1872) 75, (1885) 57.

The produced juga, adjacent in front of the tylus and split vertically and horizontally, and the elongated body, separate this genus at a glance from all other Heteroptera. The following species is the only member of the genus.

1. **Protenor belfragei** Haglund.

Protenor belfragei Haglund (1868)¹; Stal (1870) 217²; Uhler (1872) 402³, (1876) 295⁴; Van Duzee (1889)⁵, (1894)⁶, (1905)⁷, (1908)⁸, (1912)⁹; Osborn (1892)¹⁰, (1900)¹¹; Gillette and Baker (1895)¹²; Montgomery (1902)¹³; Bueno (1908b)¹⁴, (1910b)¹⁵; Smith (1910)¹⁶; Parshley (1914)¹⁷; Barber (1914)¹⁸.

Tetrarhinus quebecensis Provancher (1872) 76¹⁹, (1885) 57²⁰.

Description.—Color flavescent, closely and regularly punctate with piceous dots above, more sparsely punctate with pale fuscous or rufescent dots beneath; body, legs, and antennæ elongate, slender.

Head bearing a short mediodorsal groove between antenniferous tubercles; juga contiguous above, surpassing tylus, and split at tip vertically and horizontally so that head terminates in four short processes. Antennæ red, about as long as body.

Venter of abdomen pale, marked with a median black line continued between hind coxæ, and about a dozen black dots on each side. Hypopygium of male produced below into a caudomesal sharp spine directed posteriorly. Sixth ventral segment of female slightly split at tip and with a medioventral tubercle near the posterior margin.

Size 12-15 x 1.2-1.8 mm., males slightly smaller than females.

This widespread and rather common species in the northern States is rare in the habitat of the three other species of the tribe. With the exception of single references to Texas⁴ and Florida¹⁸ respectively, it appears to be limited to the territory north of Maryland and the Ohio River and east of the Rocky Mountains. In the north it is reported in Canada⁵⁻⁸⁻¹⁹⁻²⁰, Maine¹⁷, Massachusetts¹³, New York⁶⁻⁷⁻¹⁴⁻¹⁵, New Jersey¹⁶, Maryland³⁻⁴, Ohio¹¹, Michigan³⁻⁴, Wisconsin^{4-5-m}, Illinois^{4-g}, Iowa^{10-b}, Colorado³⁻⁴⁻¹². The available collections show that it has been found in all parts of Wisconsin including the northern tier of counties.

The immature feed on sedges, and the adults are especially common in low meadows after the first of August and until frost, probably hibernating.

Darmistus Stal.

Haplotype *subvittatus* Stal.

Darmistus Stal (1859a) 469, (1867) 543, (1870) 217, (1873) 88; Distant (1881) 160.

One comparatively uncommon species from the southwestern states and Mexico constitutes this genus. The body, legs and antennæ are not as elongate as in *Protenor* and the shape of the juga is entirely different.

2. *Darmistus subvittatus* Stal.

Darmistus subvittatus Stal (1859a) 469¹, (1870) 217; Distant (1881) 160²; Gillette and Baker (1895)³; Snow (1906a)⁴; Van Duzee (1914)⁵.

Description.—Flavescent, more or less suffused with dark fuscous above, deeply and regularly punctate, black punctures arranged in a pair of dorsal and a pair of lateral vittæ on head and pronotum, the lateral continued on basal segments of antennæ. Antennæ with second and fourth segments subequal, each nearly twice as long as first. Sixth ventral segment of female entire at apex.

Size 10-11 x 1.5-1.7 mm.

This low-ground western species was described from Mexico and has been collected in Colorado^{3-b}, Brownsville, Texas⁴, California⁵ and *New Mexico*^b. As the mature insects are found in Colorado in late August and September and again from March to June, they must hibernate as adults. The young reach maturity during August, breeding on *Spartina* and probably other low ground grasses.

Cydamus Stal.Haplotype *adspersipes* Stal.*Cydamus* Stal (1860) 33, (1867) 542, (1870) 216, (1873) 88; Distant (1881) 159.

The only member of this South American genus found north of Mexico is the species listed below. In form and general appearance there is a close resemblance to *Darmistus*, although the antennal lengths indicate a similarity to *Protenor*. The armed scutellum distinguishes from all other Alydinae.

3. **Cydamus borealis** Distant.*Cydamus borealis* Distant (1881) 159; Snow (1906a) 151.

Description.—Pale ochraceous, punctured with fuscous, dark punctures in longitudinal rows. Antennae with first and fourth segments subequal in length, each as long as second and third together. Pronotum with a slender spine at each lateral angle and scutellum with an acute spine at apex.

Size 8–9 x 1.5 mm.

Snow has reported the collection of this Central American form in Texas. No material is at hand.

Esperanza Barber.Haplotype *texana* Barber.*Esperanza* Barber (1906) 269.*Cydamus*, subgenus *Esperanza*, Bergroth (1913).

A genus erected for *E. texana* on the basis of the following characters: Jugal not attaining the tip of the broad tylus; rostrum as in other Micrelytrini; pronotal angles rounded, unarmed; posterior angles of metapleura not acute, but forming a right angle as in *Alydus*; femora unarmed.

4. **Esperanza texana** Barber.*Esperanza texana* Barber (1906) 270.

Description.—Head mottled with fuscous; antennae yellow, first segment short, spotted with fuscous, second and third subequal, longer than first and more faintly marked, fourth fuscous except at base and apex; rostrum with first segment thickened, yellow, spotted. Pronotum with mediodorsal raised smooth line. Membrane fuscous. Legs long and slender, yellow, spotted with fuscous.

This description is an abstract of Barber's, as the species, based on one male from Brownsville, Texas, has not been seen by the writer.

Tribe **Leptocorisini** Stal (1872).

Gerrida Stal (1867) 543, (in error), (1870) 217.

Leptocorisaria Stal (1872) 54, (1873) 85.

Leptocorisini Van Duzee (1917).

Only one subtropical species represents this large cosmopolitan tribe in the United States and but two genera are known in the western hemisphere. The remainder are Asiatic and African. The comparatively long third rostral segment and the unusually small size of the head for Alydinae are the diagnostic characters of the group.

Leptocoris Latreille.

Orthotype *varicornis* Fabricius.

Leptocoris Latreille (1829) 197; Stal (1873) 86, 87; Distant (1881) 161; and many other authors.

Gerris Fabricius (1803, not 1794); Stal (1865) 87, (1867) 543, (1868) 66, (1870) 217.

Myodocha Latreille (1807) 126, nom. nud.; et al. auct.

Myodochus Leach (1815) (1832) (not *Myodocha* Latreille (1810), a valid name in Lygaeidae); Burmeister (1835) 325; Herrich-Schaeffer (1848) 94.

Leptocorise Latreille (1825) 421, not Latin.

Leptocorixa Berthold (1827) 418, nom. nud.; et al. auct.

Stenocoris Burmeister (1838) 1010; Herrich-Schaeffer (1853); Stal (1873) 87, as subgenus.

Leptocoris Westwood (1840) 483, in error.

Rhabdocoris Kolenati (1845) 67; Stal (1873) 86, as subgenus.

Erbula Stal (1873) 86, as subgenus.

Leptocoris, as indicated by the many references* and synonyms, is a widespread genus with species in all parts of the world. Three of them belong to the western hemisphere, and one has been collected in the United States. The long juga, which exceed the tylus separate it from the neotropical *Lyrnessus*.

5. **Leptocoris** *tipuloides* De Geer.

Cimex tipuloides De Geer (1773) 354; Goeze (1778); Retzius (1783); Gmelin (1788).

Myodocha tipuloides Latreille (1807); Lamarck (1816); Laporte (1832).

Myodochus tipuloides Olivier (1811); Burmeister (1835).

Leptocoris tipuloides Brulle (1835); Amyot et Serville (1843); Dallas (1852) 484;

Guerin (1857) 391; Mayr (1866) 113; Stal (1870) 218, (1873) 87; Uhler (1876)

294; Distant (1881) 162, (1901) 331; Van Duzee (1909)²; Barber (1914)³.

Leptocoris crudelis Westwood (1842) 18.

Description.—Color pale flavescent, marked with olivaceous and rufescent. Head much shorter than pronotum, juga united to tip above tylus, which they slightly surpass. Antennae nearly as long as body, reddish except dark apices of second and third segments. Rostrum with second segment subequal to two apical segments together; third about as long as fourth, which is black at tip.

* A much longer list of references is given by Van Duzee (1917); the ones omitted above are European papers in which American species are not especially considered and in which the terms *Leptocoris* and *Myodocha* are used. The history of the genus name is given by Van Duzee in Can. Ent. 46:378, 379, 1914.

Pronotum with lateral angles rounded, unarmed. Posterior angles of metapleura acutely produced. Posterior femora reaching only half way to tip of abdomen, pale at base, rufescent at apex.

Venter pale, immaculate, darker toward apex. Sixth ventral segment of female entire, produced posteriorly into a large flat mesal lobe. Male with the hypopygium truncate unarmed at tip, completely covering the genitalia except above.

This Central and South American species has been recorded from Texas¹ and Florida²⁻³. It is the only member of subgenus *Stenocoris* Burmeister and may be distinguished from the other species from neighboring territory by the rufescent tips of the femora and the produced, entire, sixth ventral segment of the female. The body and legs are more elongate than those of any other Coreid.

Tribe *Alydini* Stal (1867).

With one exception all the common North American members of the Alydinae belong to this tribe and nearly every species is widely distributed in the northern states. Owing to great uniformity in appearance among the fifteen nearctic species of the group, more or less confusion has existed in their determination in the past, and the distribution of some species is therefore in doubt.

KEY TO GENERA OF ALYDINI.

- a. Posterior tibiae strongly curved and produced into a distinct tooth near the apex; lateral angles of pronotum acute, armed with a spine; openings of ventral scent glands distinct, with long sulci. *Hyalymenus*
- aa. Posterior tibiae straight, not produced into a tooth at apex (except obsoletely in *Burtinus*).
 - b. Openings of scent glands distinct, continued laterad as a sulcus with a callous margin; antennae with first segment surpassing apex of head, fourth subequal to second and third segments together.
 - c. Antennae with first segment longer than second; sixth ventral segment of female split on the medioventral line.
 - d. Posterior femora without tooth near base, tibiae unarmed; posterior metatarsus twice as long as two apical segments together. *Megalotomus*
 - dd. Posterior femora with an obtuse tooth near base; apex of posterior tibiae armed with a small acute tooth; posterior metatarsus about one and one-half times as long as two apical segments together. *Burtinus*
 - cc. Antennae with first segment shorter than second; sixth ventral segment of female entire. *Alydus*
 - bb. Openings of scent glands obscure or obsolescent, without a callous-margined sulcus; antennae with first segment short, not surpassing apex of head, fourth segment much shorter than second and third together.
 - c. Posterior tibiae unarmed; posterior margin of pronotum armed with an obsolete tooth or none. *Tollius*
 - cc. Posterior tibiae armed with two rows of strong spines; posterior margin of pronotum with a mesal tooth. *Stachyocnemus*

Hyalymenus Amyot et Serville.Logotype *dentatus* Fabricius.*Hyalymenus* Amyot et Serville (1843) 223; Dallas (1852) 467; Herrich-Schaeffer (1853) 243; Stal (1867) 542, (1870) 210, (1873) 90; Distant (1881) 156.*Tivarbus* Stal (1859a) 459.*Galeottus* Distant (1893) 459.

The genus *Hyalymenus* as now limited includes all American species of Alydini in which the posterior coxæ are subcontiguous and the posterior tibiæ, compressed, curved, and armed with a strong tooth at the apex. The former character separates it from *Apidaurus*, of which the species *conspersus* is to be found in Mexico and South America.

No representatives of subgenus *Hyalymenus* in which the corium is transparent like the membrane, are known north of Central America and the Antilles. Our species all belong to subgenus *Tivarbus* Stal.

KEY TO SPECIES OF HYALYMENUS.

- a. Male with posterior tibiæ serrate on the anterior margin near the middle; pleura with two to three large shining flavous spots; antennæ refusent.
 b. Humeral spines not very long, width between apices not over one and one-third times as great as width of head; posterior femora gradually darker toward tip.....*tarsatus* Fabr.
 bb. Humeral spines very long, width between their apices over one and one-half times width of head; posterior femora flavescens, suddenly dark ferruginous at tip.....*longispinus* Stal
 aa. Male with posterior tibiæ entire; pleura without shining flavous spots; antennæ black.....*pulcher* Stal

6. *Hyalymenus tarsatus* Fabricius.*Alydus tarsatus* Fabricius (1803) 250.*Alydus atratus* Fabricius (1803) 257.*Alydus diversipes* Westwood (1842) 19; Dallas (1852) 477.*Alydus affinis* Westwood (1842) 19; Dallas (1852) 477.*Alydus obscurus* Westwood (1842) 19.*Alydus sinuatus* Herrich-Schaeffer (1846) 98; nec Fabricius.*Alydus recurvatus* Herrich-Schaeffer (1846) 98.*Alydus pallens* Dallas (1852) 476.*Tivarbus tarsatus* Stal (1859) 460.*Camptopus pectoralis* Stal (1860) 34.*Hyalymenus tarsatus* Stal (1868) 62, (1870) 212; Uhler (1876) 294; Distant (1881) 156; Barber (1906)²; Snow (1907)³.*Camptopus tarsatus* Walker (1871) 162.*Galeottus formicarius* Distant (1893) 459.*Tivarbus diversipes* Uhler (1894) 236.

Description.—Color varying from pale flavescent to dark fuscous or nigricant; thorax with a small white spot near posterior margin of sides of pronotum and two or three large lateral white spots on the pleura near coxæ; abdomen with a row of medioventral white spots.

Abdomen depressed, third to sixth segments in the male each armed with a lateral spine, those of fourth and sixth longer than others. Male with the posterior femora armed at middle with a prominent spine and

near tip with a serrate and dentate ridge; posterior tibiae expanded, crenulate on the anterior margin at the curve. Female with the posterior femora armed with four large spines and two small teeth; posterior tibiae less expanded, not crenulate.

Size 14-17 x 2.5-3 mm.

This variable tropical species is well known from Mexico to Brazil and has been captured in Texas², Arizona³, and California.¹

7. *Hyalymenus longispinus* Stal.

Hyalymenus longispinus Stal (1870) 213; Banks (1910)¹; Barber (1914)².

Alydus (*Camplopus*) *sinuatus* Guerin (1857) 390, 391; (nec H. S., nec Fabr.)

Stal introduces *longispinus* as a new name for the Cuban species which Guerin identified and described as "*sinuatus* H. S.," with the only added information that it differs from *tarsatus* in the fact that the spines of the lateral angles of the pronotum are twice as long and directed more nearly dorsad. The characters given in the key are taken from a female kindly loaned by Mr. H. G. Barber, who records the species from Florida.¹⁻² It is slightly smaller than *H. tarsatus*.

8. *Hyalymenus pulcher* Stal.

Alydus pulcher Stal (1854) 235.

Hyalymenus pulcher Stal (1870) 211; Distant (1881) 156, (1893) 372; Banks (1910)¹.

Banks lists this Central American species as occurring in Texas.¹ It differs from *H. tarsatus* in the black color of the antennae and in the absence of the pleural white spots. The anterior margin of the posterior tibiae of the male is entire and the posterior femora are provided with a series of small teeth throughout their length. Distant's statement that it can be distinguished from "all varieties of *H. tarsatus* by the marginal ventral spines" is apparently incorrect, as this is a secondary sexual character in both species. The armature of the femora is distinctive, however, and the tibiae and apices of the posterior femora are nearly always black. Size 17 x 3.5 mm.

Megalotomus Fieber.

Logotype *limbatus* Herrich-Schaeffer = *junceus* Scopoli.

Megalotomus Fieber (1861) 58, 226; Stal (1872) 54, (1873) 90, 92; Montandon (1893) 50.

Alydus Stal (1867) 542; (1870) 214, (in part).

Iluphus Mulsant and Rey (1870) 158, (a palearctic subgenus of *Megalotomus*).

The lateral angles of the pronotum are more acute and the body and legs are more elongated and slender in this cosmopoli-

tan genus than in *Alydus*, there being a close resemblance in many respects to *Burtinus*. Only one species occurs in the United States, although another, somewhat smaller one (*pallescens*) is found in the West Indies.

9. *Megalotomus quinquespinosus* Say.

Lygacus quinquespinosus Say (1825) 323¹; [(1859) 247²].

Alydus cruentus Herrich-Schaeffer (1848) 100²; Dallas (1852) 477.

Alydus quinquespinosus Uhler (1861) 23, (1875) 832³.

Alydus (*Megalotomus*) *quinquespinosus* Stal (1870) 214⁴.

Megalotomus (or *Alydus*) *quinquespinosus* Uhler (1876) 294⁵, (1877a) 406⁶, (1878b) 383⁷; Provancher (1885) 56⁸; Osborn (1892)⁹, (1904)¹⁰; Montandon (1893)¹¹; Van Duzee (1894)¹²; Gillette and Baker (1895)¹³; Snow (1904)¹⁴, (1906b)¹⁴; Crevecoeur (1905)¹⁵; Bueno (1905)¹⁶, (1908)¹⁷, (1913a)¹⁸; Bueno and Brimley (1907)¹⁹; Van Duzee (1908)²⁰, (1917)²¹; Bueno and Englehardt (1910)²²; Smith (1910)²³; Parshley (1914)²⁴.

Description.—Color dusky flavescens to rufous. Head black beneath and with a transverse semilunar black spot above; sternum of thoracic and sometimes basal abdominal segments black. Antennae with first three segments flavescens, sometimes darker at apex, subequal in length, fourth segment much longer and with apical two-thirds fuscous.

Pronotum with lateral angles acute, and with a transverse, elongate concavity along posterior margin of the disc. Legs pale flavous, except apical half of posterior femora which is red; the latter armed with five or six spines and surpassing apex of abdomen.

Claspers of male with a large tooth-like mesal expansion near base and a long attenuated apex. Sixth ventral of female split at tip, lateral plates of hypopygium widely separated at base, convergent, broadly rounded at apex, and with mesal margins entire.

This is one of the most widely distributed Coreidæ of the northern states and appears in nearly every faunal list of Heteroptera in the temperate zone. In addition to Montandon's record of its occurrence in Florida¹¹, which has not been confirmed by later collectors, it has been found in Canada⁸⁻¹¹⁻²⁰, *Maine*²⁴, Massachusetts¹¹, New York¹¹⁻¹²⁻¹⁶⁻¹⁷, New Jersey¹⁶⁻²³, Pennsylvania⁷, North Carolina¹⁸⁻¹⁹⁻²², *Ohio*¹⁰, Illinois^{4-g}, Wisconsin^{11-s-m-u}, *Iowa*^{9-b}, *Kansas*¹⁵, Colorado^{5-13-b}, Utah⁶, *Arizona*¹⁴, California³, Washington²¹, and Vancouver Island²¹. Collected in Wisconsin in Milwaukee^m, Dane^{s-a-m-u}, Sauk^c, Vernon^m, Pierce^m, Polk^s, and St. Croix^m counties, but not so common as *Protenor belfragei* and *Alydus conspersus* and not extending so far north. After the first of August the adults may be found along the edges of woods where they are active flyers. The nymphs feed on *Oxytropis* in Colorado, according to Dr. Ball, and probably on Lupine, reaching maturity in July.

Burtinus Stal.Haplotype *notatipennis* Stal.*Burtinus* Stal (1859a) 458, (1873) 90.*Alydus* Stal (1867) 542, (1870) 214; in part.

Although closely related to the preceding genus which is typically boreal, the species of *Burtinus* are tropical in distribution and only one has been found in our fauna. The generic characters are sufficiently described in the synopsis.

10. **Burtinus notatipennis** Stal.*Burtinus notatipennis* Stal (1859a) 459¹, (1862) 305; Barber (1910) 5², Van Duzee (1917)³.*Alydus notatipennis* Stal (1870) 214; Walker (1871) 160; Distant (1893) 373⁴; Barber (1914)⁵.*Alydus (Megalotomus) femoralis* Distant (1881) 158⁶.*Alydus (Burtinus) femoralis* Distant (1893) 373⁷.*Burtinus femoralis* Uhler (1894)⁸.

Description.—Color varying from pale flavescent to dusky ochraceous mottled and punctured with brown, more or less marked with black on head and venter. Antennæ, rostrum, and legs similar to those of *M. 5-spinosus*, but posterior femora with apical half usually marked with fuscous, sometimes flavo-annulate, not rufescent, not attaining apex of abdomen, and usually with an obsolete little tooth near base; tibiæ armed at the apex with a small spine.

Male with lateral and mesal margins of claspers subparallel to near the obliquely truncate tip. Female with mesal plates of hypopygium armed near base with a blunt lateral tooth, which engages a notch in the mesal margin of the convergent lateral plates.

Described from Central America¹⁻⁴⁻⁶⁻⁷, Mexico¹⁻⁷, and South America¹ and collected since in Lower California⁸, Arizona², Florida⁵ and Texas³. The relationship with Distant's species was proposed by Uhler⁸ and this position has been supported by Barber⁵. *B. femoralis* should possibly, however, be listed as a variety for it is larger and paler than the form which Stal described. No other differences have been found. The specimens at hand are from Arizona (kindly loaned by Mr. Barber) and Linares and Cuernavaca, Mexico, from the Ball collection.

Alydus Fabricius.Orthotype *calcaratus* Linnaeus.*Alydus* Fabricius (1803) 248; Stal (1859a) 458, (1867) 542, (1870) 213, (1872) 54, (1873) 90; Fieber (1861) 58, 225; Distant (1881) 157; Provancher (1885) 55; Montandon (1893); Barber (1911).**Alyde* Latreille (1825) 421.

The type genus of the Alydinæ is one of nearctic origin with two palearctic and seven nearctic species. It is a compact group of closely similar forms united by the possession of

* A more complete list of early references is given by Van Duzee (1917). Only those works on which the modern conception of the genus is based are named above, all except two of those before 1860 being omitted.

armed posterior femora, unarmed pronotum and tibiae and well developed scent gland orifices.

The species have been described singly with only meager comparative notes, with the result that superficial instead of fundamental characters have usually been employed to distinguish them. A synopsis of the genus based on coloration and wing characters has been published by Barber (1911). Owing to numerous variations, especially in *A. eurinus* and *A. conspersus*, the present writer has been compelled to rely on genitalia for the separation of these two species and their relatives. Fortunately, this method is easy to apply as *Alydus* has the claspers of the male exposed instead of covered. They are described in the Key as seen from the caudal aspect; no dissection is necessary.

KEY TO SPECIES OF ALYDUS.

- a. Venation of the membrane simple, veins not irregular and only slightly anastomosing; claspers of male when arcuate not toothed near apex; posterior femora not with pale annulus.
- b. Pronotum with lateral angles blunt, and sides and lateral margins not distinctly paler than the disc.
- c. Claspers of male with caudomesal margins subparallel, caudal aspect narrow (Fig. 2); female of *pluto* with lateral plates of hypopygium terminating in a tumid finger-like process (Fig. 1); sixth ventral segment with a distinct median earina; mainly mountain species.
- d. Antennae with fourth segment shorter than second and third together, third subequal to second; body black, not densely pilose; (genitalia, figs. 1, 2)..... *pluto* Uhl.
- dd. Antennae with fourth segment more than one-third longer than second and third together, third shorter than second; body variegated with fuscous, densely pilose; (♂ claspers, fig. 3)..... *lomentosus* n. sp.
- cc. Claspers of male not with caudo-mesal margins parallel; lateral plates of female hypopygium flat, not tumid at tip, sixth ventral segment with carina short, indistinct or wanting; widely distributed species.
- d. Claspers of male twisted, not arcuate (Fig. 5); lateral plates of female hypopygium acute at apex (Fig. 4); pronotum usually black; membrane infuscate..... *eurinus* Say.
- dd. Claspers of male arcuate, divaricate at base and convergent at tip (Fig. 8); lateral plates of female hypopygium broadly rounded at apex (Fig. 7); pronotum usually with posterior two-thirds fulvous; membrane often spotted..... *conspersus* Montd.
- bb. Pronotum with lateral angles acute and lateral margins pale; claspers of male with lateral expansion and acuminate tip (Fig. 10); lateral plates of female hypopygium bluntly rounded, approximate at apex (Fig. 9)..... *pilosulus* H.-S.
- aa. Venation of membrane, or at least costal third, irregular with anastomosing veins; posterior femora with pale annulus near apex; claspers of male elongate, arcuate, with an enlarged stout mesal tooth near apex (Fig. 6)..... *scutellatus* Van D.

11. *Alydus pluto* Uhler.

Alydus pluto Uhler (1872) 401, 402¹, (1876) 294², (1877a) 406³, (1904)⁴; Gillette and Baker (1895)⁵; Snow (1906b)⁶; Van Duzee (1916)⁷, (1917)⁸; [Heideman (1902); Barber (1911)].

Description.—Color piceous black throughout entire head, body and appendages except as follows: Head with fulvous brown spot between ocelli, two behind each eye, and sometimes a minute one in front of eye; antennæ castaneous on base of first three segments, fourth fuscous; pronotum rarely with obscure fuscous areas on the disc; tibiæ castaneous except at tip, metatarsi flavous at base; corium infusate. Abdominal margins rarely spotted. Form robust, moderately hairy, rather sparsely punctate. Antennæ with second and third segments together subequal to fourth.

Claspers of the male (Fig. 2) with only their narrow subparallel posterior edges showing in a caudal view, and with slight mesal expansions, near base; unlike those of any other species, except *tomentosus*. Female with lateral plates of the hypopygium (Fig. 1) terminating in a long, finger-like tumid lobe. These genital characters separate them at a glance from the robust specimens of *eurinus* from which they are almost indistinguishable by other means.

Size, ♂, 10.5–11 x 3; ♀, 12–13 x 3 mm.

A great deal of confusion has existed in regard to this species, owing to its similarity to robust forms of *eurinus*. This is evidenced by Heidemann's reference to its "very hairy" character, Barber's indefiniteness as to its identity, and Osborn's recording it from Iowa (1892) and Ohio (1900), each time with a query "(?)." After a careful study of all accessible material in the genus, the writer is convinced that the species defined above by the peculiar genitalia is the one Uhler described. The great similarity, however, in all other respects to *A. eurinus* var. *obesus* casts a doubt on the distribution records east of the Rocky Mountains. Uhler reports its presence in Colorado¹⁻²⁻³⁻⁵, Idaho¹⁻², Texas², New Mexico⁴, Kansas¹⁻², and Louisiana¹⁻², while *Arizona*⁶, *California*⁷, *Utah*⁸, *Washington*⁸, and *Vancouver Id.*⁸ have since been added. The only specimens at hand are from Fort Collins, Sterling, and Dutch Gorge, Colorado, (Ball collection), and Dilley, *Oregon*, (from Mr. Barber).

12. *Alydus tomentosus* n. sp.

Description.—Color black, mottled with dark brown; body and legs densely covered with long, fine, black and white setæ intermixed; form more robust than in *eurinus* and not so large as in *pluto*. Head black, marked on each side with a longitudinal flavescent ante-ocular line, slightly broken at tip of antenniferous tubercle and extending nearly

to apex of jugum; also a short, pale fuscous vitta caudo-ventrad of each eye. (One specimen in addition shows a small fuscous spot behind the ocelli). Antennæ fuscous, first, second and third segments black toward apex; fourth segment more than one-third longer than two preceding together, first shorter than second, subequal to third, and attaining apex of head. Rostrum piceous, paler at incisions, first segment longest, slightly longer than second and subequal to two apical ones together; fourth one-half longer than third.

Pronotum densely punctate, black, mottled with fuscous on posterior half of the disc and on the sides, sometimes with an indication of short mediodorsal and lateral marginal fulvous lines near anterior margin. Scutellum black, flavescent at tip. Corium castaneous, mottled with flavescent; membrane infuscate. Thorax and abdomen black beneath, densely hairy, sides of thorax rugose and deeply punctate. Scent gland orifices well developed. Margins of abdomen minutely flavo-maculate. Legs with the coxæ, trochanters, and tibiæ castaneous, the latter black at tip; femora black, armed with three or four long spines. Claspers of the male with mesal margins subparallel, caudal surfaces slightly expanded laterally near tip. (Fig. 3).

Size ♂, 10 x 2.6 mm.

Holotype: ♂, from Ft. Collins, Colorado.

Paratype: ♂, from La Animas, Colorado; both in the Ball collection.

This western form might easily be mistaken for *eurinus*. The male genitalia are somewhat similar to those of *pluto*, from which, however, the species is distinguished by the length of the last antennal segment, the brownish mottling of the pronotum, the fuscous corium, the smaller size, and the dense covering of long, soft, pale hairs which give the insect a greyish cast. It is possible that Heidemann had it in mind when he stated (1902) that *A. pluto* is "very hairy." None of the specimens of *pluto* at hand are as hairy as *eurinus* and Uhler's description does not indicate such a condition, his only reference to setæ being the statements that the head is pubescent, the pronotum "a little pubescent" and with bald callosities, and venter, "pubescent at tip." The species here described is more densely hairy than any other *Alydus* and the second and third antennal segments are relatively much shorter. The types are from Colorado, where they were collected at comparatively low altitudes.

13. *Alydus eurinus* Say.

Lygaeus eurinus Say (1825) 324¹, (1859) 247.

Alydus eurinus Uhler (1872) 401², (1875) 832³, (1876) 293⁴, (1877a) 406⁵, (1878a) 504⁶, (1878b) 384⁷; Distant (1881) 157; Provancher (1885) 53⁸; Van Duzee (1889)⁹, (1894)¹⁰, (1903)¹¹, (1908)¹², (1917)¹³; Osborn (1892)¹⁴, (1900)¹⁵; Montandon (1893)¹⁶; Gillette and Baker (1895)¹⁷; Montgomery (1902)¹⁸; Wirtner (1904)¹⁹; Snow (1904)²⁰, (1906b)²⁰; Bueno (1905)²¹, (1908)²², (1910a)²³, (1910b)²⁴, (1912)²⁵; Bueno and Brimley (1907)²⁶; Tucker (1907a) (1907b)²⁷; Bueno and Engelhardt (1910)²⁸; Smith (1910)²⁹; Barber (1911); Parshley (1914)³⁰.

Alydus ater Dallas (1852) 478; Stal (1870) 213³¹.

Alydus pluto Prov. (1855) 56; (?) Osborn (1892), (1894), (1900).

Coriscus vicarius Prov. (1887) 175, in error.

Description.—Head, thorax, venter, and femora piceous black, verging at times to dark castaneous and sometimes apparently griseus in pilose individuals. Flavescent spots at base of head (as in *pluto*) and along margins of abdomen. Antennae castaneous marked at the tip of each segment with piceous; apical segment fuscous; first shorter than second or third, which together are subequal to or a little longer than fourth.

Caudal aspect of clasper of male (Fig. 5) with a tumid hemispherical area at base from which arises a propeller-shaped lobe, showing a broad caudo-mesal face; claspers approximate except along caudal margin. Female with lateral plates of hypopygium (Fig. 4) flat, acute at tip, convergent; mesal plates obliquely truncate, sixth ventral segment with carina very short, indistinct, or wanting.

The only *Alydus* reported from every section of the United States is *A. eurinus*, although in Wisconsin it is not as widespread as the following species and is rare north of Madison. Throughout its range the adults are numerous in late summer along road sides and the edges of woods on goldenrod and other fall flowers. The young have been bred on *Astragalus* in Colorado, appearing the middle of May.

The recorded distribution is as follows: Quebec 5-12, Ontario⁹, Maine⁷⁻³⁰, New Hampshire⁷⁻²³, Massachusetts⁷⁻¹⁶⁻¹⁸, Connecticut¹⁶, New York 10-21-22-24-25, New Jersey²¹⁻²⁹, Pennsylvania¹⁹, Virginia²⁸, North Carolina²⁶⁻²⁸, Georgia¹³, Florida¹⁶, Ohio^{7-15-b}, Illinois^{31-g}, Wisconsin^{31-s-m-a}, Iowa^{14-16-b}, Missouri¹, Arkansas¹, Nebraska², Kansas^{27-b}, Texas⁴, Dakota⁶, Montana⁶, Colorado⁵⁻¹⁷, Arizona³⁻²⁰, Utah¹³, California¹³.

The characters appearing in the literature do not serve to differentiate this species from *A. pluto* on one hand and *A. conspersus* on the other. In fact it is necessary to examine the genitalia in order to distinguish them. Some of the *eurinus* of the upper Mississippi valley are densely black and very robust, closely resembling *A. pluto*. These may be known as:

13a. *Alydus curinus* var. *obesus* n. var. (= *A. pluto* auct. in part). Black, punctate, moderately pilose; pronotum tumid, about 3 mm. wide; corium black or nearly so; posterior tibiæ usually black. Length 12 to 13 mm.

Holotype: ♂ from Urbana, Ill. Author's collection.

Allotype: Topotypic. Author's collection.

Paratype: ♀ from Columbus, O. Ball collection.

13b. *Alydus curinus* var. *eurinus* Say, the typical form of the species, is marked with fulvous brown on the corium, often mottled with flavescent, the pronotum is flatter on the disc and not over $2\frac{1}{2}$ or $2\frac{3}{4}$ mm. wide, and the posterior tibiæ are fulvous brown to fuscous. Length 10 to 12 mm. At the same time there is sufficient intergrading to make it certain that only one species possesses the distinctive genitalia.

14. *Alydus conspersus* Montandon.

Alydus conspersus Montandon (1893)¹; Osborn (1894)², (1900)³; Van Duzee (1894)⁴, (1908)⁵; Heideman (1902)⁶; Wirtner (1904)⁷; Bueno (1905)⁸, (1910b)⁹; Snow (1907)¹⁰; Smith (1910)¹¹; Barber (1911); Parshley (1914)¹².

Alydus calcaratus Uhl. (1861); in error.

Alydus rufescens, Barber (1911); ss below.

Description.—Head and anterior third of pronotum shining black, finely punctate; pronotum with posterior two-thirds usually fulvous to castaneous, occasionally darker, rarely black. Corium varying from mottled fuscous and flavescent to nearly black. Membrane spotted (var. *conspersus*) or infusate (var. *infuscatus*). Segments of antennæ varying in color and length, but fourth not exceeding second and third together by more than one-eighth of their length; abdominal margins and connexivum with pale segmental maculæ or continuous rufescent border.

Male with claspers (Fig. 8) divaricate at base, arcuate as seen from the caudal aspect, convergent at tip, leaving an oval or pyriform opening. Female with lateral plates of hypopygium (Fig. 7) with mesal margins parallel and apices broadly rounded, mesal plates apparently squarely truncate at tip.

In Wisconsin and neighboring states *A. conspersus* is much more common than *eurinus*. It was originally separated from the latter on the basis of the spotted membrane and greyish to castaneous posterior two-thirds of the pronotum and these characters hold for a majority of the specimens seen. The strongly arcuate male claspers, surrounding an oval opening, and the character of the lateral plates of the female hypopygium which have their mesal margins subparallel and are broadly rounded at the apex are, however, the only characters on which complete reliance may be placed.

From August 1st until late fall, the adults are found in every section of Wisconsin, including the most northern counties. They copulate in September and October, and the winter is apparently passed in the egg stage.

Three varieties of this species, differing considerably from each other in color, may be distinguished as follows:

- a. Membrane pale with many fuscous dots; abdomen and margins of connexivum with flavescens maculae.....var. *conspersus* Mont.
- aa. Membrane infuscate, not dotted.
 - b. Connexivum and margin of venter, black with flavescens maculae.....var. *infuscatus* n. var.
 - bb. Connexivum and margin of venter broadly rufescent, latter to beyond spiracles; rufescent band sometimes slightly broken by the encroaching black coloration.....var. *rufescens* Barber

14a. *Alydus conspersus* var. *conspersus* Montandon is the typical form and the only one which has been recognized heretofore as belonging to the species. In addition to the spotted membrane, it is characterized by fulvous pronotum (except cephalic third) and castaneous corium. The distribution is strictly boreal, including Canada⁵, Maine¹², Massachusetts¹, New York⁴⁻⁹, New Jersey⁸⁻¹¹, Pennsylvania⁷, Ohio,³ Michigan¹, Illinois⁶, Indiana⁶, Wisconsin^{s-m-a-u}, Iowa^{1-2-b}, Dakota¹, Colorado^{1-6-b}, and Arizona¹⁰. The Arizona reference may concern var. *rufescens*.

14b. *Alydus conspersus* var. *infuscatus* n. var. is the melanic form of the species, closely resembling and usually identified as *eurinus*. The pronotum and corium are fuscous, sometimes even piceous, and the membrane is dark, entirely without spots. This variety and the typical *conspersus* have been captured copulating on flowers. In the available material a large number of males belong to the variety, but few females, and all the high mountain and extreme northern specimens are of this type. The distribution may possibly be limited to the northern boundaries of the spread of the species.

Holotype: ♂, from Madison, Wisconsin. State collection.

Allotype: topotypic. State collection.

Paratypes: 2 ♂s from Dutch Gorge and Palmer Lake, Colorado, respectively. Ball collection.

14c. *Alydus conspersus* var. *rufescens* Barber (*Alydus rufescens* Barber (1911) 29, 30) has been considered a distinct species heretofore but the genitalia prove it to be a southern variety of *A. conspersus*. The head, pronotum, and corium

resemble those of var. *conspersus* but the membrane is infuscate and unspotted. The venter is dull bronzy black and the margins, to beyond the spiracles, rufescent, sometimes also with rufous spots on the disc; lateral rufescent band is sometimes broken into segmental maculæ.

Described from Huachuca Mountains, Arizona. A pair of topotypes was kindly loaned the author by Mr. Barber.

15. *Alydus scutellatus* Van Duzee.

Alydus scutellatus Van Duzee (1903) 108¹, (1917)²; Cockerell (1910)³; Barber (1911).

Description.—Color variegated brown and black. Head above black with mesal and lateral rufous or flavous lines and about four spots of the same color, two behind the ocelli and two between antennæ. Antennæ as in *eurinus*, fourth segment shorter than second and third together. Pronotum with anterior margin dull black and mediodorsal line depressed; posterior two-thirds, and corium, fulvous brown, spotted with black. Membrane varying from pale between veins to fuscous throughout, venation varied, but always irregular and reticulated. Venter of head and thorax black, that of abdomen black with flavous or fuscous markings varying from a small area on the fifth ventral to the entire abdomen. Femora fuscous to picuous, posterior with a broad subapical pale annulus.

Male with claspers (Fig. 6) more elongate than in other species, armed inside near apex with an expanded triangular tooth, and curved sharply cephalo-laterad at tip. Female unknown.

Described from New Mexico¹ and reported since from Colorado²⁻⁴, Montana²⁻⁶, and British Columbia². A specimen is also in the Milwaukee Museum labeled "Rauterberg col., Dubuque, Iowa." It is possible that this is a boreal and alpine form which will be found along the upper Mississippi. In the Rocky Mountains it has been collected from 8000 feet up to the timber line.

The species is well marked and comparatively constant. The peculiar genitalia, annulate femora, and black scutellum cause it to be unmistakable. Cockerell's material differed from the type in the pale but spotted venter and comparatively pale membrane.

16. *Alydus pilosulus* Herrich-Schaeffer.

Alydus pilosulus H.-Sch. (1848) 101; Uhler (1876) 294¹, (1878b) 384²; Montandon (1893) 50³; Montgomery (1902)⁴; Bueno (1905)⁵, (1908b)⁶, (1910b)⁷, (1913a)⁸; Hine (1907?)⁹; Tucker (1907a)¹⁰, (1907b)¹¹; Bueno and Brimley (1907)¹²; Van Duzee (1909)¹³, (1914)¹⁴, (1917)¹⁵; Smith (1910)¹⁶; Bueno and Englehardt (1910)¹⁷; Barber (1911)¹⁸, (1914)¹⁹; Parshley (1914)²⁰.

Alydus eurinus Stal (1870) 213, nec Say.

[*Alydus vittinosus* Harris, (Cata. Ins. Mass. 1833) according to Uhler (1878) 384].

Description.—Color varying from black marked with fuscous to pale flavescent, with a few black maculæ. Head black, with a longitudinal flavescent line on dorso-meson, a pair through eyes, and another below eyes, these lines sometimes widened until only narrow black vittæ remain between them. Disc of pronotum varying from fulvous brown to fuscous, anterior third black, except at middle; margins and sides of pronotum flavescent (except near anterior margin), covered with a dense mat of white soft setæ. Sternum black, pleura fuscous to black. Venter varying from black to rufescent.

Male with claspers (Fig. 10) parallel on mesal margin, narrow at base, suddenly expanded laterally below middle, acuminate at tip. Lateral plates of female hypopygium (Fig. 9) convergent, contiguous at tip, causing mesal plates to appear triangular in shape. Size: ♀, 11–12 x 2.2–2.5 mm.; ♂ distinctly shorter and much more slender.

Less confusion has existed in regard to the identity of this species than that of the other common members of the genus as its characteristics are marked. The pronotum with its acute angles and pale margins and sides, as well as the unusual form of the genitalia are distinctive.

The distribution extends from Maine and Florida to Kansas and Texas with a single California record. The list of States is as follows: *Maine*²⁰, *Massachusetts*²⁻³⁻⁴, *New York*⁵⁻⁶⁻⁷, *New Jersey*⁵⁻¹⁶, *Pennsylvania*^{15-g}, *Delaware*¹⁵, *Maryland*¹, *Virginia*⁴⁷, *North Carolina*⁸⁻¹², *Florida*³⁻¹³⁻¹⁹, *Indiana*^g, *Illinois*^{1-g}, *Wisconsin*^m, *Iowa*^b, *Missouri*^{3-m}, *Nebraska*^m, *Kansas*^{10-11-b}, *Louisiana*⁹, *Texas*¹⁻²¹, *Oklahoma*¹⁻¹⁵, *California*¹⁴.

Tollius Stal.

Haplotype *curtulus* Stal.

Tollius Stal (1870) 213 (as subgenus), (1873) 89 (as genus).

Although closely similar in appearance, the structural differences between *Alydus* and *Tollius* are marked. In the latter the scent gland orifices are obsolescent, the first antennal segment does not attain the apex of the head, the posterior femora surpass the tip of the abdomen and the claspers of the male are flat and approximate. Two species have been described.

KEY TO THE SPECIES OF TOLLIUS.

- a. Claspers of male elongate, nearly four times as long as wide, gradually twisted near truncate apex; corium with lateral margin and often entire disc dotted with fuscous, apical margin not paler; median line of pronotum and scutellum obscure, at least posteriorly. *curtulus* Stal
- aa. Claspers of male short, not over three times as long as wide, suddenly obliquely truncate, acute at apex; corium with lateral half pale, immaculate, apical margin conspicuously so, unspotted; median pale line of pronotum and scutellum conspicuous; lateral margins of pronotum pale.

setosus Van D.

17. *Tollius curtulus* Stal.

Alydus curtulus Stal (1859b) 234¹.

Alydus (Tollius) curtulus Stal (1870) 213.

Tollius curtulus Uhler (1876) 294², (1894) 236³; Gillette and Baker (1895)⁴; Barber (1911)⁵; Van Duzee (1916)⁶, (1917)⁷.

Description.—Color varying from grayish testaceous to fuscous; pubescent. Head grey above, marked with pale longitudinal stripes through eyes, beneath eyes and obscurely along dorso-meson; ventral surface black. Antennæ pale, first and fourth segments darker.

Pronotum griseous, disc marked with a pair of fuscous, slightly divergent vittæ, more obscure than in *setosus*. Scutellum with median line obscure. Corium always marked along costal margin with fuscous dots, which sometimes cover entire surface. Femora mottled, sometimes flavo-annulate.

Claspers of male (Fig. 11) slender, one-fourth as wide as long, with basal half flattened, apical half gradually twisted; apex subtruncate, especially as seen from the side; caudo-lateral portion of pygofers tumid, distinctly marked off from the ventral surface of the segment by a deep notch ventrad of their apex. Female with lateral plates of hypopygium contiguous at tip; mesal plates elongate, triangular, resembling those of *Alydus pilosulus*.

Length, 9.5 to 11 mm.; width 2.2 to 2.7 mm.

The widespread distribution of this comparatively uncommon insect has not been appreciated until recently. It is now known from New York⁵, Illinois^m, Colorado⁴, Utah⁷, Oregon, California¹⁻²⁻⁶, and Lower California³. The Illinois record is from a Chicago specimen in the Milwaukee museum and the Oregon one from ten specimens kindly loaned by Mr. H. G. Barber.

The shape of the male claspers at the apex, and of the pygofers are distinctive, though the twisted shape of the claspers makes the truncate apex difficult to see. The color markings of the insect are not nearly as attractive as in *setosus*, the sharp contrasts of the latter being wholly wanting. Twenty-six specimens from New York, Illinois, Colorado, Oregon and California have been examined by the writer and the description is based on them.

18. *Tollius setosus* Van Duzee.

Alydus setosus Van Duzee (1906)¹; Snow (1907)²; Barber (1911)³; Bueno (1913b)⁴.

Tollius setosus Van Duzee (1914)⁵; (1917)⁶.

Description.—Color flavescent to castaneous, marked attractively with fuscous. Dorso-mesal pale line continuous from tylus to tip of scutellum, conspicuous. Ventral surface of head black, often narrowly. Divergent vittæ of pronotum conspicuous. Corium with the anal

area much darker than the costal and apical margins which are unspotted. Femora various in color.

Claspers of male (Fig. 12) short, flat, quadrangular, suddenly obliquely truncate at tip, dorso-lateral apex acute; caudo-lateral portion of pygofers scarcely tumid, apex rectangular, not distinctly marked off from ventro-caudal margin of segment by a notch. Female with lateral plates of hypopygium slightly wider at base than in *curtulus*.

Size 10 x 2.4 mm.

Originally described as an *Alydus* and compared with *A. eurinus*, *Tollius setosus* has never been satisfactorily distinguished from Stal's species. The variability in coloration in each of them and their similarity in distribution has caused some confusion. The characters used above are derived from a pair collected by Mr. Van Duzee, in California, compared by him with the type, a male, and kindly loaned the author. Two other specimens are at hand, a female from Mt. View, California, in the Ball collection, and a male sent from Mr. H. G. Barber, as having been collected in Kingsbridge, N. Y. These are identical with those from Mr. Van Duzee.

The distribution of *T. setosus* includes Arizona¹⁻², Utah⁶, California^{4-5-b} and Montana⁶, in addition to the *New York* record.

Stachyocnemus Stal.

Haplotype *apicalis* Dallas.

Stachyocnemus Stal (1870) 215, (1873) 91.

Many characters make this genus the most aberrant one of the tribe. The complete obsolescence of the scent-gland orifices, the spinose posterior tibiae, the shape of the male hypopygium which conceals the claspers, and the absence or concealment of the mesal plates of the female hypopygium are unique. The affinities are clearly with *Tollius*.

19. **Stachyocnemus apicalis** Dallas.

Alydus apicalis Dallas (1852) 479¹.

Stachyocnemus apicalis Stal (1870) 215; Uhler (1872) 402², (1876) 294³, (1877b) 1325⁴; Heidemann (1902) 81⁵; Snow (1906a)⁶, (1906b)⁷; Van Duzee (1909)⁸; Smith (1910)⁹; Bueno (1913a)¹⁰; Barber (1914)¹¹.

Description.—Body covered with short stiff black setae and more or less gray pubescence. For color, see varieties below. Antennae with first segment widened to tip, second and third slender, subequal; fourth longer and thicker than others.

Pronotum with posterior margin bearing a mesal tooth. Hemelytra variable in length, usually slightly surpassing apex of abdomen. Anterior and intermediate femora and tibiae slender and unarmed; posterior

femora thickened, attaining apex of abdomen and armed beneath with two rows of acute teeth; posterior tibiae armed with two rows of strong spines, those of inner row longer than the others.

Size 7.5-8 x 2-2.5 mm.

Taking the two varieties together, the species is known from Florida¹⁻²⁻³⁻⁸⁻¹¹, North Carolina¹⁰, District of Columbia⁵, New Jersey⁹, New York, Indiana⁸, Colorado^{5-b-g}, Dakota², Montana⁶, Texas²⁻³⁻⁶, Arizona⁷, New Mexico¹ and California³. In the east, according to Mr. Barber, it is "well established, but rarely taken by collectors, possibly because they do not know just where to look for it—in sandy spots."

Two varieties are found in the United States, so different in appearance that they may possibly prove to be distinct species. They may be separated as follows:

- a. Juga projecting cephalo-laterad from tylus so that head appears to be three-pointed; body with little or no gray pubescence, general color black, marked with dark ferruginous; head strongly depressed; caudo-mesal tooth of pronotum minute. var. *apicalis*
- aa. Juga scarcely projecting, indistinct as seen from above; body covered with fine grey pubescence; general color gray-flavescent; head not depressed; caudo-mesal tooth of pronotum prominent. var. *cinereus*

The typical variety (*apicalis*, Fig's 13, 13a) is piceous black, slightly marked with dark reddish brown. It is eastern in distribution, ranging from Florida, the type locality, to New York. Specimens from Florida, New Jersey and New York have been examined.

Stachyocnemus apicalis var. *cinereus* n. var. (Fig's 14, 14a) does not answer Dallas' description of the species in any particular. It is flavescent in color, covered with dense fine white pubescence, marked above with a large fuscous triangle on the pronotum. The femora and venter are mottled, yellow and brown with numerous small dots.

Holotype: male from Fort Collins, Colorado.

Allotype: from Gunnison, Colorado.

Paratypes: male from LaSalle, Colorado; female from Fort Collins, Colorado. All in the Ball collection.

In addition to the type material the writer has examined a considerable number of specimens of the latter variety from Colorado; Hessville, Indiana; and Helena, Montana, in the Gerhard collection, and one from the Huachuca Mountains of Arizona from Mr. Barber. The types were taken at comparatively low altitudes in Colorado (5000 to 7000 feet) and were found running about the surface of the ground. Dates of capture include June, July, August, and September.

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EXPLANATION OF PLATES.

PLATE XXIV.

- Fig. 1. *Alydus pluto*. Caudo-ventral aspect of female genitalia. *mp*, mesal plates; *lp*, lateral plates of hypopygium; *6*, sixth abdominal segment. The lateral plates apparently represent the seventh, and the mesal plates the eighth ventral segment.
- Fig. 2. *Alydus pluto*. Male genitalia, showing the caudal aspect of the claspers.
- Fig. 3. *Alydus tomentosus*. Claspers of male.
- Fig. 4. *Alydus eurinus*. Female hypopygium.
- Fig. 5. *Alydus eurinus*. Claspers of male.
- Fig. 6. *Alydus scutellatus*. Claspers of male.
- Fig. 7. *Alydus conspersus*. Female hypopygium.
- Fig. 8. *Alydus conspersus*. Claspers of male.
- Fig. 9. *Alydus pilosulus*. Female hypopygium.
- Fig. 10. *Alydus pilosulus*. Claspers of male.
- Fig. 11. *Tollius curtulus*. Claspers of male. *pf*, caudo-lateral portion of pygofer.
- Fig. 12. *Tollius setosus*. Claspers of male.

PLATE XXV.

- Fig. 13. *Stachyocnemus apicalis* var. *apicalis*.
- Fig. 14. *Stachyocnemus apicalis* var. *cinereus*.